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EXAMINER

CONNELLY CUSHWA, MICHELLE R

ART UNIT	PAPER NUMBER
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2874

DATE MAILED: 10/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/612,660

Applicant(s)

CHEN ET AL.

Examiner

Michelle R. Connelly-Cushwa

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 01 August 2006.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-18 and 20-42 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1,17,18,21-28,32-40 and 42 is/are rejected.  
7) ☒ Claim(s) 2-16,29-31 and 41 is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 02 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received. .  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 8/1/06.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Response to Amendment***

Applicant's Amendment filed August 1, 2006 has been fully considered and entered.

### ***Information Disclosure Statement***

The prior art documents submitted by applicant in the Information Disclosure Statement filed on August 1, 2006 have all been considered and made of record (note the attached copy of form PTO-1449).

It is noted that due to the excessive number of references cited by Applicant, in the previous Office action the Examiner requested that Applicant identify the 20 most relevant references and the specific parts of these references that *relate to the claimed subject matter* (i.e. any reference that describes an optoelectronic element coupled to an optical fiber or other optical medium via two lenses) so that a more thorough review of this material could be timely performed by the Examiner.

Applicant did not respond to this request.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

**Claims 21-24 and 32 are rejected under 35 U.S.C. 102(b) as being anticipated by Gaebe (US 5,684,901).**

Regarding claims 21; Gaebe discloses an optical coupler (see Figure 3) comprising:

- a means (the spherical ball lens, 32) for spherically focusing light (11) from a light source (laser, 10);
- a means (the aspherical lens ,48) for aspherically focusing light from the means for spherically focusing light; and
- means for inputting light into an optical medium (the air surrounding the aspherical lens, 48, may be considered to be an optical medium, since light passes through air) from the means for aspherically focusing light.

Regarding claim 22; the combination of the air surrounding the aspherical lens, 48, and the optical fiber (see column 4, lines 4-31) may be considered to be the optical medium.

Regarding claim 23;

- the laser (10) is a vertical cavity surface emitting laser (see Figure 3; the cavity of the laser may be considered to be a vertical cavity and the laser emits light, 11, from a surface); and

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- the fiber may be a single mode optical fiber (see column 1, lines 11-19).

Regarding claim 24; the means for spherically focusing light (32) conveys more light power than the means for aspherically focusing light (48).

Regarding claim 32; Gaebe discloses an optical coupler (see Figure 3) comprising:

- an aspherical lens (48) on an optical axis;
- a spherical lens (32) on an optical axis;
- an optoelectronic element (10); and
- an optical medium (an optical fiber);
- wherein both the aspherical lens and the spherical lens are considered to be proximate to both the optoelectronic element and the optical medium for optical coupling to occur between the optoelectronic element and the optical medium.

**Claims 1, 21-24, 26-28, 32 and 42 are rejected under 35 U.S.C. 102(e) as being anticipated by Blasingame et al. (US 2004/0247242 A1).**

Regarding claim 1; Blasingame et al. discloses an optical coupler (see Figures 3 and 6; paragraph [0029]; and claims 9 and 12-18 of Blasingame et al.) comprising:

- a spherical ball lens (25); and
- an aspherical lens (26) configured to directly contact an optical fiber (33);

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- wherein the spherical ball lens and the aspherical lens are situated in the same optical path on a common optical axis.

Regarding claims 21 and 22; Blasingame et al. discloses an optical coupler (see Figures 3 and 6) comprising:

- a means (the spherical ball lens, 25) for spherically focusing light (14) from a light source (laser, 11);
- a means (the aspherical lens ,26) for aspherically focusing light from the means for spherically focusing light; and
- means for inputting light into an optical medium (an optical fiber, 33) from the means for aspherically focusing light;
- wherein the optical medium contacts the means for aspherically focusing light.

Regarding claim 23;

- the laser (11) is a vertical cavity surface emitting laser (see paragraph [0022]); and
- the fiber may be a single mode optical fiber (33; see paragraph [0026]).

Regarding claim 24; the means for spherically focusing light (25) conveys more light power than the means for aspherically focusing light (26).

Regarding claims 26 and 27; Blasingame et al. discloses a method for coupling light (see Figures 3 and 6), comprising:

- spherically focusing light (14) from a light source (11) with a ball lens (25) resulting in a first portion of light having a first focal point on an

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optical axis and a second portion of light having a second focal point on the optical axis; and

- aspherically focusing the first portion of light and the second portion of light with an aspherically-shaped lens (26) resulting in the first and second portion of light having a common focal point at a point of contact between an aspherical lens and an optical medium (see Figure 3).

Regarding claim 28; the common focal point is at a place of an optical medium (33).

Regarding claim 32; Gaebe discloses an optical coupler (see Figures 3 and 6) comprising:

- an aspherical lens (26) on an optical axis;
- a spherical lens (25) on an optical axis;
- an optoelectronic element (11); and
- an optical medium (an optical fiber, 33);
- wherein both the aspherical lens and the spherical lens are considered to be proximate to both the optoelectronic element and the optical medium for optical coupling to occur between the optoelectronic element and the optical medium.

Regarding claim 42; the aspherical lens includes a substantially flat portion that is configured to directly contact the optical fiber (see Figure 3).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 17, 18, 25 and 33-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gaebe (US 5,684,901).**

Regarding claims 17, 18, 25 and 33-37; Gaebe discloses an optical coupler (see Figure 3) comprising:

- a spherical ball lens (32); and
- an aspherical lens (48);
- wherein the spherical ball lens and the aspherical lens are situated in the same optical path on a common optical axis;
- wherein that the optical coupler is for coupling to an optical fiber (20; see Figures 1 and 2, the title of the patent, the abstract, and column 4, lines 4-31);
- wherein the optoelectronic element (10) is a vertical cavity surface emitting laser light source (see Figure 3; the cavity of the laser may be considered to be a vertical cavity and the laser emits light, 11, from a surface);
- wherein the optical medium may be a single mode optical fiber (see column 1, lines 11-19)



Gaebe discloses all of the limitations of these claims as applied above, except for specifically stating that the spherical lens comprises a glass material or that the aspherical lens comprises a non-glass or plastic material.

Gaebe does not suggest that the lenses (32 and 48) are made of any particular material, thereby indicating a lack of criticality in the particular material forming the lenses.

Spherical and aspherical lenses are both known to be formed by either glass and/or plastic materials in the art. Plastic materials provide improved mechanical consistency, lower component manufacturing costs for complicated structures due to molding techniques that are employed in the art, and a reduction in weight, which can reduce additional costs associated with shipping and/or incorporating the elements (in this case lenses) in optical systems. Ball or spherical lenses are simple shapes that are easily made from glass materials, which exhibit well known standard properties, and advantageously have improved heat tolerances and offer higher refractive index values, when compared to plastics. It is noted that both glass spherical lenses and plastic aspherical lenses are well known, commonly used, and readily available in the art.

Therefore, one of ordinary skill in the art would have found it obvious to use a glass ball spherical lens in the invention of Gaebe and thereby provide a lens with well known standard properties, good heat tolerance, and a high refractive index, since such lenses are well known, commonly used, and readily available in the art. Additionally, one of ordinary skill in the art would have found it obvious to use a plastic aspheric lens in the invention of Gaebe and thereby provide a lens with a more complicated structure

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that has low manufacturing costs and reduced weight, since such lenses are well known, commonly used, and readily available in the art.

Regarding claims 38 and 39; Gaebe teaches or suggests all of the limitations of claims 38-40 as applied above, except for the optoelectronic element being a detector. However, one of ordinary skill in the art would have found it obvious to replace the laser with a photodetector in order to form an optical receiver with efficient coupling between the photodetector and the optical fiber.

Regarding claim 40; the fiber may be multi-mode (see column 1, lines 15-19).

***Allowable Subject Matter***

Claims 2-16, 29-31 and 41 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The prior art cited on attached form PTO-892 is the most relevant prior art known, however, the invention of claims 2-16, 29-31 and 41 distinguishes over the prior art of record because none of the references either alone or in combination disclose or render obvious:

- a coupler, as defined in claim 2, wherein the spherical lens comprises a glass material and the aspherical lens comprises a non-glass material in combination with the aspherical lens being configured to directly contact an optical fiber and the other limitations of base claim 1;

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- a method, as defined in claim 29, wherein the ball lens comprises a glass material and the aspherically-shaped lens comprises a plastic material in combination with the first and second portions of light having a common focal point at a point of contact between an aspherical lens and an optical medium and the other limitations of base claim 26 and intervening claims 27 and 28;

Claims 3-16 and 41 depend from claim 2; and claims 30 and 31 depend from claim 29.

Hence, there is no reason or motivation for one of ordinary skill in the art to use the prior art of record to make the invention of claims 2-16, 29-31 and 41.

### ***Response to Arguments***

Applicant's arguments filed August 1, 2006 have been fully considered but they are not persuasive.

The rejection under 35 U.S.C. 112, 2<sup>nd</sup> that was set forth in the previous Office action has been withdrawn in view of Applicant's Amendments to the rejected claims.

*Claims 1, 17, 18, 21-24, 26-28 and 32 were previously rejected under 35 U.S.C. 102(b) as being anticipated by Gaebe (US 5,684,901).*

Regarding claim 1, Applicant states that Gaebe does not teach or suggest an aspherical lens configured to directly contact an optical fiber. The Examiner agrees. The rejection of claim 1 over Gaebe has been withdrawn in view of Applicant's amendment to the claim.

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Regarding claims 17 and 18; Applicant states that Gaebe does not teach or suggest that the spherical lens comprises a glass material or that the aspherical lens comprises a non-glass or plastic material. The Examiner agrees that Gaebe does not explicitly state this. Accordingly, the rejection of claims 17 and 18 under 35 U.S.C. 102(b) over Gaebe has been withdrawn in view of Applicant's amendment to the claim. However, amended claim 17 and claim 18 are presently rejected under 35 U.S.C. 103(a) over Gaebe.

Regarding claims 21-24; Applicant states that Gaebe does not teach or suggest an optical medium contacting the means for aspherically focusing light. The Examiner disagrees. The term "optical medium" is a very broad term. In fact, air may be considered to be an optical medium, since light passes through air. The rejection has been rewritten to address Applicant's amendments to the claims.

Regarding claims 26-28; Applicant states that Gaebe does not disclose a common focal point at a point of contact between an aspherical lens and an optical medium, as defined in amended claim 26. The Examiner agrees. The rejection of claims 26-28 under 35 U.S.C. 102(b) over Gaebe has been withdrawn in view of Applicant's amendments to the claims.

Regarding claim 32; Applicant states that the term proximate means "immediately preceding or following (as in a chain of events, causes or effect)" and cites Merriam-Webster's Collegiate Dictionary, 11<sup>th</sup> edition, 2003. The term proximate is defined as "1 : immediately preceding or following (as in a chain of events, causes, or effects)" or "2 : very near : CLOSE" as defined in Merriam-Webster's Collegiate

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Dictionary, 10<sup>th</sup> edition, 1993. As can be seen by the varying definitions, the term proximate is broad and encompasses elements that are very near or close to something. And, as noted in the rejection, both lenses are considered to be proximate to both the optoelectronic element and the optical medium in order for optical coupling to occur.

*Claims 1, 17, 18, 21-24, 26-28 and 32 were previously rejected under 35 U.S.C. 102(e) as being anticipated by Blasingame et al. (US 2004/0247242 A1).*

Regarding claims 1, 17, 18, 21-24, 26-28 and 32; Applicant states that a half-ball lens is clearly not an aspherical lens. Applicant further states that a "spherical lens" is defined as "[a] lens whose surfaces form portions of spheres". Aspheric lenses are lenses that have one aspheric surface. A half-ball lens has a flat surface that is aspheric. For reference only, page 6.34 of the Melles Griot catalog is attached to this Office action. As can be see from the description of aspherical condenser lenses on this page, a lens having a spherical side surface and a plano back surface (pictured in the middle at the bottom of the page) is an aspheric lens. A half-ball lens has a spherical side surface and a plano back surface. Furthermore, Figure 3 of the present application illustrates an aspherical lens having a curved surface that forms a portion of a sphere, which appears to be in direct contrast to applicants statement that a spherical lens is a lens whose surfaces form portions of spheres.

*Claims 2-4, 6, 8, 10-12, 19, 20, 25, 29-31 and 33-37 were previously rejected under 35 U.S.C. 103(a) as being unpatentable over Gaebe (US 5,684,901).*

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Applicant states that the Examiner makes various assertions on page 9 without citing any source of authority. After reviewing page 9 of the office action, it is presumed that Applicant is referring to the following statements from the Office action:

- spherical and aspherical lenses are both known to be formed by either glass and/or plastic materials in the art;
- plastic materials provide improved mechanical consistency, lower manufacturing costs for complicated structures due to molding techniques that are employed in the art, and a reduction in weight, which can reduce additional costs associated with shipping and/or incorporating the elements in optical systems; and
- ball or spherical lenses are simple shapes that are easily made from glass materials, which exhibit well known standard properties, and have improved heat tolerances and offer higher refractive index values when compared to plastics.

First, Applicant has not identified which if any of these statements are believed to be untrue or are disputed. The Examiner requests that if Applicant disagrees with any of the above statements after reviewing the accompanying documentation and considering the knowledge generally available to one of ordinary skill in the art, that the Applicant go on record identifying which statements are known to be untrue and why. In any event, the following references are being cited for their general discussion on the use of plastic and glass materials for forming lenses:

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Althaus et al. (US 2002/0196824 A1) discloses that spherical or aspherical lenses may be made from suitable optical material that includes glass or plastic (see paragraph [0041]).

Kittaka et al. (US 2003/0076598 A1) discloses that a plastic aspherical lens is inexpensive because it can be mass-produced by pressing, and that the plastic lens will have less tolerance to temperature or humidity compared to a glass lens (see paragraph [0054]).

Ning ("Plastic vs. Glass Optics: Factors to Consider") discloses that plastics have high-volume production capability, have low manufacturing costs, offer a less difficult way to produce surface shapes other than spheres when compared to glass materials, are lightweight, are shatter-resistant, and offer more consistent quality (see pages 1-2); that glass materials are harder than plastics, more durable and more stable over wider temperature and humidity ranges; and that lenses are made from both glass and plastic.

Given the knowledge generally available to one of ordinary skill in the art, as summarized by the Examiner on page 9 of the Office action, and as supported by the presently cited references at Applicant's request, it is apparent that one of ordinary skill in the art would have been familiar with both glass and plastic lenses, and would have found it obvious to incorporate a lens of either material into the invention of Gaebe, especially since Gaebe does not specify the material used. Furthermore, given the higher temperature tolerances of glass and the ease of manufacture of a spherical lens even with glass, one of ordinary skill in the art would have found it obvious to form the

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spherical lens of glass since it is positioned beside the laser, which is known to generate heat. And, given the numerous advantages of plastics, including light-weight, low manufacturing cost, precise molding availability, and shatter-resistance, one of ordinary skill in the art would have found it obvious to form the aspherical lens from a plastic material.

In response to applicant's argument that there is no motivation present, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941. (Fed. Cir. 1992). In this case, the knowledge of the materials in question and the specific known advantages would motivate one of ordinary skill in the art to use glass for the spherical lens and plastic for the aspherical lens in the invention of Gaebe, as discussed above.

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a



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reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Furthermore, it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

*Claims 2-4, 6, 8, 10-16, 19, 20, 25, 29-31 and 33-40 were previously rejected under 35 U.S.C. 103(a) as being unpatentable over Blasingame et al. (US 2004/0247242 A1).*

The rejection has been withdrawn in view of Applicant's statements. Blasingame et al. does not qualify as prior art under 35 U.S.C. 103(a).

### **Conclusion**

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning the merits of this communication should be directed to Examiner Michelle R. Connelly-Cushwa at telephone number (571) 272-2345. The examiner can normally be reached 9:00 AM to 7:00 PM, Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney B. Bovernick can be reached on (571) 272-2344. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry of a general or clerical nature should be directed to the Technology Center 2800 receptionist at telephone number (571) 272-1562.

  
Michelle R. Connelly-Cushwa  
Patent Examiner  
October 13, 2006